

New approach for Virtual Surgical Planning (VSP) and mandibular reconstruction utilizing the occipital crest as a native midline landmark (Zaghal Triangle)



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Biography

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Abstract

Virtual surgical planning (VSP) using computer-aided design and manufacturing (CAD-CAM) has been reported to aid in craniofacial reconstruction. The reported improvements have been related mainly to operative performance, with limited evaluations of the position and function of the temporomandibular joint (TMJ). This study analyzed the radiographic details of postoperative outcomes of mandibular reconstruction related to the TMJ as well as the mandibular Gonian angles utilizing the external occipital crest of the cranial base as alternative to the sagittal plane for mirror image purpose.

Materials and Methods: A 16 years old Patient (history of gunshot injury 8 months ago) underwent mandibular reconstruction traditionally with 2.7mm plate bent in place conventionally was analyzed. The patient underwent preoperative medical Multi Slice computed tomography of the skull and virtual planning was performed preoperatively using (DICOM) data. CT images were digitized 3-dimensional analysis using surgical planning software (Materialize). The Cranial Base Triangle has been utilized to relate the mandibular angles to more fixed point of the cranial base with the external occipital crest as a native midline landmark. This Triangle was developed as equilateral triangle between the angles of the mandible and the middle of the external occipital crest, in order to assess the postoperative work with the same triangle. STL model were printed out to bend a Stryker 2.7mm new plate with flushed borders to be adapted precisely on the patient's native bone through a submandibular approach and an anterior iliac bone graft simultaneously.

Results: The patient initially presented to us with massive disfigurement with a counter clock wise rotation of the condyle bearing segment of the affected side apparently under the effect of the temporalis muscle with a limited mouth opening and deviation while opening. Post-operative (virtual planning) was analyzed to compare the condyle segment with the previous position as well as the angles of the mandible. The virtual surgical planning utilizing the cranial base triangle gives a better position for both the condyle and the angle with more symmetrical position and the condyle in more favorable position within the glenoid fossa.



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